

Claims

1. A digital test module for testing a phase locked loop circuit, the module comprising:
 - 5 phase detection means for performing phase measurements of the phase locked loop circuit;
 - analogue test means for testing at least one analogue element of the phase locked loop circuit;
 - frequency measurement means for performing frequency
 - 10 measurements of the phase locked loop circuit; and
 - means for performing calibration and jitter measurements.
2. A system comprising the module of claim 1 and the phase locked loop circuit integrated in a single device.
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3. The module of claim 1 wherein the phase detection means comprises:
 - a reference clock path having first delay means and first latch means coupled to receive a reference clock signal from the phase locked loop circuit; and,
 - 20 a feedback clock path having second delay means and second latch means coupled to receive a feedback clock signal from the phase locked loop circuit, wherein the first latch means is latched by the feedback clock signal
 - 25 and the second latch means is latched by the reference clock signal.
4. The module of claim 3 wherein the first and the second delay means each comprise a series of delay blocks, each delay block being formed by four inverters.
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5. The module according to claim 1 wherein
the means for performing calibration and jitter
measurements includes a multiplexer arranged to receive
the reference clock signal and a doubled reference clock
5 signal from the phase locked loop circuit.

6. The module of claim 5 wherein the means for
performing calibration and jitter measurements includes a
series of delay blocks arranged as a ring circuit, each
10 of the delay blocks providing a delayed output to a
decoder.

7. The module of claim 6 wherein each of the delay
blocks is formed by four inverters.
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8. The module according to claim 1 wherein the analogue
test means comprises:
a test controller arranged to perform testing of the at
least one analogue element;
20 a first digital-to-analogue converter coupled to the test
controller and arranged for providing a first analogue
output; and
a second digital-to-analogue converter coupled to the
test controller and arranged for providing a second
25 analogue output,
wherein the first and second analogue outputs are used in
combination to test the at least one analogue element.

9. The module of claim 8 wherein the first analogue
30 output is substantially constant.

10. A method of testing a phase locked loop circuit using a built-in test module, the method comprising the steps of:

- measuring the frequency of the phase locked loop circuit;
- 5 measuring the phase of the phase locked loop circuit;
- measuring frequency jitter of the phase locked loop circuit;
- measuring phase jitter of the phase locked loop circuit;
and,
- 10 testing at least one analogue element of the phase locked loop circuit.